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STUDY AND DEVELOPMENT OF SHOP-CENTERED TEAM TEACHING FOR POTENTIAL HIGH SCHOOL DROP-OUTS.

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A RATIONALE AND PROCEDURE FOR THE EFFECTIVE VOCATIONAL EDUCATION OF LOW ACHIEVING HIGH SCHOOL STUDENTS WAS DEVELOPED FROM AN ANALYSIS OF 13 HIGH SCHOOL PROGRAMS IN 10 SAN FRANCISCO BAY AREA SCHOOL SYSTEMS WHERE THE RICHMOND PRE-ENGINEERING TECHNOLOGY PROGRAM WAS UNDER OPERATION. EXPERIMENTAL EFFORTS WERE MADE TO ESTABLISH SHOP-CENTERED TEAM TEACHING PROGRAMS IN THE THREE HIGH SCHOOL DISTRICTS IN SANTA CRUZ COUNTY, CALIFORNIA, WITH PARTIAL PROGRAMING AT CABRILLO JUNIOR COLLEGE. UNDERACHIEVING ELEVENTH AND TWELFTH GRADE PUPILS WITH GOOD POTENTIAL AND AN INTEREST IN SCIENCE WERE TAUGHT ON A HALF-DAY SCHEDULE BY A TEAM OF TEACHERS REPRESENTING SCIENCE, MATH, ENGLISH, AND SHOP. THE FINAL REPORT INCLUDES A DESCRIPTIVE SUMMARIZATION OF CONCLUSIONS ABOUT PROBLEMS AND PROCEDURES RELATED TO THE OPERATION, EMPHASIZING THAT IT WAS DESIGNED FOR SPECIAL GROUPS OF PUPILS, PARTICULARLY FOR THOSE NOT WELL SERVED BY THE EXISTING ACADEMIC PROGRAM. AN INFORMAL APPRAISAL OF THE PROGRAM INDICATES THAT IT HAS BEEN A SUCCESS WITH ALL STUDENTS IN SOME AREAS AND WITH SOME STUDENTS IN ALL AREAS. (JK)

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William R. Odell, *Professor of Education*

Office of Education Grant Number OEG 4-6-008524-0578
Vocational Education Act of 1963, P.L. 88-210, section 4 (c)

The Leland Stanford Junior University
Stanford, California

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INTRODUCTION

Traditional Concepts of Education

The organizational pattern of an American high school for the most effective education of its enrollees is highly complex and almost defies analysis, let alone justification. This is true not only for the content of the offering and the knowledge-mastery and other expectancies for its graduates, but for the organizational structure of the institution itself. The present pattern of the American comprehensive high school has emerged from an interplay over the years of basic value systems that exist in our western society, traditions about educational content and method, various theories concerning learning, and the bewildering complexities involved in operating a single school institution to meet all of the needs of the complete gamut of educable youth within available resources.

It is beyond our present concern here to attempt to trace all of these elements from their sources, even were it within our competence to do so. But mention of a few of the central concepts appears relevant.

Probably the most basic traditional concept of education is that its central concern is to impart knowledge. A second traditional concept was that education was for the select few. The Greek and Roman educational systems were constituted for the purpose of developing an intellectual elite. Both Plato and Aristotle devoted attention to "which knowledge is of most worth" (which later still concerned Herbert Spencer and many others) for the aristocratic group. In general, everywhere in earlier times education was considered mostly to be simply a matter of passing along the most important knowledge in existence at the particular time to a selected group of pupils.

In essence, therefore, education traditionally was conceived to be chiefly an intellectual affair. To be sure, there has always been concern about aspects other than the intellectual. Greek education determinedly sought development of both mind and body. The current dictionary definition of education mentions "acquisition of knowledge, skill, or discipline of character". "Education of the whole child" is a common recent phrase, emphasizing especially the emotional development of the learner along with the intellectual.

It is true also that the desirability of including "practical" learning has been debated through the generations. But the common residuum concerning the "true" meaning of education still remains in the view of most people largely a process of intellectual development and culturally significant knowledge-acquisition by the learner. In the mind's eye still today a school usually consists basically of classrooms containing rows of pupils reading from identical textbooks looking toward the teacher in the front of the room who talks a great deal of the time, pausing frequently to use the blackboard to emphasize what is important for all to learn as the teacher and others have previously decided.

Two aspects of the educational program have long been identified as opposing and yet complimentary. This frequently has been termed "content vs. process". Traditionally content has held the higher priority of the two. Thus transmitting the content of the accepted common culture - whether it be Grecian or Chinese or American - has been considered to be the primary task of the schools. How best to accomplish that task was considered important, but secondary.

Agreement as to what content is essential is not so easy to reach in our modern age. In recent times such major curriculum concepts have been developed and applied as "the minimum essentials," "the common core", "requirements for graduation", and the like. Each of these makes an approach to the notion of a basic minimum body of knowledge and achievement desirably common for all pupils. But what should be included as the minimum essentials or core, and what constitutes acceptable attainment necessary for graduates has not been amicably agreed upon by all alike.

These various proposed common programs have been either broad or narrow, containing more or less of the other than traditionally revered intellectual aspects of learning. The inclusion of high school offerings in home economics, shop, agriculture, commercial, art, music, and physical education has occurred but agreement upon their value for all pupils or the amount of desirable requirement is far from realization. So the basic bulk of most high school programs still consists of an intellectual content of more or less undisputed worth, with only a dash of something else thrown in. The sloyd movement, emphasis upon training for "family living", music and art appreciation, vocational education, all have their advocates and have gained acceptance of a sort. But they typically march along a pace or two to the rear in our value system of essential or desirable curriculum content for all pupils.

Debate about desirable methods of learning and instruction have paralleled the arguments about essential content, and this concern about method sometimes precipitates serious conflict over the matter of content.

Thus the ideas underlying the kindergarten, the child-centered curriculum, the project method, etc. sharply challenge the view that desirable and essential content exists in the abstract apart from consideration of the learner and his drives and interests.

There are three recent concerns about education that complicate these matters considerably. To begin with, the growing recognition of and knowledge about individual differences has added another dimension to the dilemma. When viewed in this frame of reference, that there can be any very substantial common body of content to be mastered by _all_ pupils becomes a challenging matter for debate. The conflict between required courses as opposed to elective courses is one aspect of this consideration.

Second, the problem of determining the essential or desirable content that should be mastered by all pupils, i.e. the minimum essentials or core, certainly has become much more elusive in recent years with the constant great accretion of knowledge in all fields. No one anywhere today can content-wise possess any very substantial share of existing knowledge in all of the areas of the common culture. This being so, how shall we determine which knowledge is today, and especially tomorrow, essential for all pupils?

And finally, the movement from the pattern of educating only an elite, which in early days existed in America as well as in other countries, to that of universal education for all through at least a twelve year span has been made especially complicated by all sorts of financial and other logistic problems. This latter group of limitations has perhaps had as much influence in shaping the pattern of high school organization and operation as any single theoretical consideration.

Purposes of the American Comprehensive High School

The objectives of American high schools are relatively well agreed upon when stated in general terms. While no two lists of objectives are identical, they in toto end up in essential agreement. Upon examination there appear to be two main thrusts to the proliferated purpose of the American secondary schools. The first is the development of effectively functioning citizens who support the central American concepts of individual equality and full freedom of opportunity, i.e. the democratic socialization function. The second is the development as fully as possible of the distinctive individual potentialities and abilities of each pupil, i.e. the differentiation or specialization function. The first purpose in essence aims at the development of likeness among all pupils, i.e.

understanding and the acceptance of common American social goals, while the second seeks to develop differences among pupils, i.e. individualities covering the greatest possible ranges in most ramifications of human ability.

These two objectives, while complimentary also are conflicting in an important way. Their equal realization certainly makes for substantial difficulties in the organization and operation of the American high school program. In particular the two objectives are difficult to fulfill in a single comprehensive high school institution.

The comprehensive high school consciously or unconsciously on the part of its creators, emerged logically from a determined allegiance to the first of the two objections of this institution. The comprehensive high school is peculiarly American, and an eminently appropriate sculpture in institutional form to ensure the realization of the American dream. All children living and learning together in the same school appear most favorably to predispose toward the realization of the goal of socialization as we conceive it in America, favoring a likely development of viable common values so essential for successful later adult American citizenship.

The establishment of specialized high schools, whether they be vocational, for science, or for the arts or otherwise, on the other hand contravenes this important concept of the proper role of the American high school even though such institutions do have some important advantages for individual pupils. Extensive recent demands for racially integrated urban and rural high schools grows basically out of concerns over a greater realization of the socialization role of the American high school in our modern world. For this and other reasons our direction in secondary schools development seemingly will continue to be toward even greater acceptance of the comprehensive high school.

But it should be noted in passing that the isolating of groups of "like" pupils into separate high schools deemphasizes some difficulties in program offerings and favors the individualization role within the school. The more alike pupils are in a school, the narrower can be the span of course offerings and the less will be the pressures for pupils to enroll in courses for status or conformity seeking as opposed to sound educational reasons.

The development of an adequate high school program to meet these two complementary yet opposing objectives as already noted is exceedingly challenging. And to do this in an institution where pupils run the complete gamuts of abilities and backgrounds is an even more complex undertaking. The two objectives have inherently opposite poles. The socialization function, i.e. likeness in pupils, runs immediately counter to the fact of individual differences among pupils. The individualization goal on the other hand trots easily in harness with the fact of individual pupil differences.

The _Socializational_ _Goal_. Polarization in the direction of common or even identical offerings for all high school pupils in the socialization area is supported by several factors.

Realization of the socialization role logically seems at first glance to require substantially identical school offerings for all pupils. One good citizen should be much like another. Hence both school exposure and expected achievement ought to be essentially the same for every pupil.

Paralleling this position and strengthening it is the still widely accepted common understanding among lay and professional groups alike of the meaning of the term "schooling." "Good" learning consists chiefly of or flows out of reading and listening. By this view good instructional material must have organized content;

be systematic, planned, and sequential; have discerned dimensions; and possess "solid"substance. By this definition learning is planned largely by external-from-the-learner criteria and tends to be abstract, verbal, and intellectual in nature.

Paralleling this same line of thought there exists a general acceptance also that while both conceptualization and application is required for the full realization of the socialization role of the high school, the former in large measure logically appears to be of primary concern for schools and certainly is easier process-wise to achieve in the traditional school setting. Thus traditionally and even currently teaching by precept in the high school tends to overshadow teaching by practice and example. Solid subjects (the academic) are in general held in higher regard than other subjects such as commercial, shop, and home economics, or even art and music. And extra-curricular enterprises are indeed "extra" all too often, and typically are deemed second-best even when highly regarded. Thus the processes of abstraction and generalization get top billing over the concrete and practical. And abstractions and generalizations inherently push toward common understandings and the imposition of uniformity as opposed to individualization and non-conformity.

Beyond this, a school is a place where pupils are taught what of importance has been learned by a selected group of persons who presumably best learned that body of material themselves. The popular image of the "good" teacher therefore is that of one who directs and tells, directing the learner along the paths he should follow, and telling what he (the teacher) himself has learned and deems important. Here again the tendency is overpowering to consider as desirable, outside-the-learner criteria concerning what should be learned. So once again the high school program leans heavily toward the intellectual and upon it's-good-for-you-since-it-was-good-for-me criterion for the content of the offering.

To all of this must be added the seemingly almost inescapable tendency, perhaps a kind of natural inertia, in a high school, or indeed in any kind of educational institution, to set up a common program of studies to be followed by all pupils. Life is just simpler that way for all concerned, except perhaps the learner!

As a result of all of these factors high school education so far as the socialization function is concerned tends toward intellectuality, abstractness, bookishness, content-set-in-advance-by-others-to-be-mastered, and hoped for general uniformity in outcomes among pupils. And this value system is broadly accepted by teachers, parents, employers, taxpayers and even by the "best" pupils. The class valedictorian thus is "the one who" in everyone's mind and to everybody's satisfaction. A difference in decimal place averages of the "solid" subjects grades determines the winner in this particular race.

Admittedly the foregoing has been somewhat overdrawn in order to make a point. Naturally the problem of dealing within the socialization concern of the high school program with pupils of widely varying intellectual capability plagues the staff of any American high school. There are infinite variations in approaches to finding satisfactory solutions. Ability groupings of many varieties, differentiated and specialized course offerings in a particular subject or field, low minimum essential requirements for receiving passing grades in required courses, modified marking systems, multiple textbooks, remedial courses, etc. are but a few of the common devices resorted to in dealing with the difficulty.

But in most people's estimation these inventions all are somewhat deplorable. It is down deep believed that the high schools and their pupils somehow could and should do better. After all, any high school graduate should meet a high performance level much the same as any other, should he not?

The Individualization Goal. On the other hand, realization of the differentiation or individualistic or specialized objective of the high school logically presumes different offerings for pupils. Here wide arrays of electives, prerequisite accomplishment standards for particular course enrollment, low failure and repeat incidence, highly developed specialized course sequences, differentiated curricula, etc. are generally appropriate and acceptable. In this dimension of the high school program the widely varying vocational objectives of pupils can be accommodated, as well as their many divergent interests and abilities. And, in contrast to the socialization area of concern about pupil growth and accomplishment, instead of a focus upon chiefly intellectual approaches to desirable learning, a broader spectrum of learning methodology and content is acceptable. Here can be included programs for skill development, offerings of specific occupational content, football, creativity in the arts and music, etc. And, finally, unease about differentiated end-achievement of pupils is implicitly non-existent. It is by definition to be expected.

In this area even so, much of the folk-lore and procedural patterns overflow from the socialization areas to influence counseling, teaching, and grading practices in the individualization area. In some instances this is so extreme as to obscure entirely the inherent difference between the two concerns of the high school. Where this is the case the incidence of tensions within the high school increases for teachers, pupils, and parents alike.

Shortcomings of the Comprehensive High School

An oversimplified and somewhat unfair criticism of the so-called comprehensive high school, accordingly, is that it usually really is not comprehensive at all. While it aspires to retain all pupils to completion of the twelfth year, it does not cater effectively enough to their widely varying interests and ranging abilities to make the program continuously appealing to all pupils.

Instead of using as its point of departure for program organization and content selection the discernible sharply different interests and abilities of its pupils (and teachers), the chief differentiation in offering in the typical high school is provided through developing alternative approaches to ways of teaching a more or less established body of academic content to all pupils. Thus in English effective reading, listening, speaking, and writing skills (with ability to think and communicate effectively as the real goal) often are sought through a tracking plan which attempts to differentiate among pupils according to their abilities, but which still drives in a determined identical direction for all alike. Or there is a choice presented among algebra, general math, or commercial math but again with a generalized hoped-for goal with the teachers' detectable desire and behavior much the same in all three. Or applied science, or technical chemistry are offered as alternatives to chemistry and physics. Here again the goals of all these courses tend to be the mastery of scientific principles and to amass basic scientific knowledge thought to be essential for engaging effectively in modern living.

So in spite of setting out to differentiate instructional methods and curriculum content to fit individual needs and interests we frequently end up with a standard pattern for each pupil of a uniform number of classes in a variety of separate subjects with largely a pre-determined content and basically an intellectual approach provided for both the academically and the non-academically oriented pupils alike.

Verifying this point is the fact that in discussions of changing high school curriculum patterns most attention usually is paid to the organization or reorganization of academic content. The core program, the related offerings pattern, the integrated pattern, and the broad fields pattern, all deal conceptually largely with different systems of academic subject matter inter-relatedness.* Not much time is devoted to the fundamentally opposing curriculum and instructional approach: The child-centered one. Starting with a learner's individual interests and abilities, however, bids fair to lead along different paths and to quite different final destinations than do the various patterns of course programming in most high schools today.

One Approach to a Solution

Reconciliation of all of these concerns about education - intellectual vs. practical education, content vs. process, socialization vs. individualization goals, etc. - is necessary in order to create and maintain an orderly comprehensive high school institution. Whether or not most American high schools are achieving this goal is the subject of constant debate.

Perhaps the clearest treatment of the entire problem appears in a small monograph written by

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* Spears, Harold, The Emerging High School Curriculum, American Book Co., 1940, page 52.

John Dewey many years ago.* In this treatise he approaches the problem from the point of view of how learning goes on in the learner himself.

He makes two chief points for our purposes here. First, that with physical learning, even of the simplest sort engaged in by infants, there is a mental, intellectual qualitative component.** In other words, mere physical learning after all is not so very mere. And second, that "only with children having _specialized intellectual abilities_ (italics ours) is it possible to secure mental activity without participation of the organs of sense and the muscles."***

By implication in this noting of "children having specialized intellectual abilities" Dewey acknowledges important differences among children and accordingly of the necessity to approach learning differently for them.

He goes on to say further that much even of elementary schooling consists of the "imposition of forms of discipline intended to repress all activity of the body! Under such a regime it is not surprising that children are found to be naturally averse to learning, or that intellectual activity is found to be so foreign to their nature that they have to be coerced or cunningly coaxed to engage in it! So educators blamed the children or the perverseness of human nature, instead of attacking the conditions which, by divorcing learning from use of the natural organs of action, made learning both difficult and onerous."*

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* Dewey, John, _Interest and Effort in Education_, Houghton Mifflin Co., Boston, 1913.

** Dewey, John, ibid., page 68.

*** Dewey, John, ibid., page 69.

Dewey then connects Plato, Pestalozzi, and Froebel in their stress upon the importance of "play, games, and occupations of a consecutive sort, requiring both construction and manipulation, - - - - - as of essential educational importance. The place of the exercise of bodily functions in the growth of the mind was practically acknowledged" (by Froebel in his concept of the kindergarten).** Dewey adds, "Conceived in this freer and more scientific way, the principles of Froebel undoubtedly represent the greatest advance yet made in the recognition of the possibilities of bodily action in educative growth. The methods of Montessori are based on a like recognition, with the advantage of additional technical knowledge; and if the tendency to reduce them to isolated mechanical exercises (a tendency unfortunately attendant upon the spread of every definitely formulated system) can be resisted or overcome, they undoubtedly suggest further resources that can be utilized with younger children, or with older children whose sensori-motor development has been retarded."*

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* Dewey, John, ibid., page 70.
** Dewey, John, ibid., page 72.

Dewey then develops the learning sequence through three successive stages for learners in general. The first is that of physical activity just noted. This includes the use "of the organs of the body, especially the hands, as employed directly with simple materials, or at most such simple appliences as a pencil, a brush, etc."**

Then comes the second phase: "A higher order of activity involving the sensori-motor apparatus of the body ... when the control over external objects is achieved by means of tools of some sort, or by the application of one material to another. The use of a saw, a plane, ... illustrate the intervention of tools. ---- It is the discovery and use of extra-organic tools which has made possible, both in the history of the race and of the individual, complicated activities of a long duratinn, that is with results long postponed. And ... it is this prolongation and postponement which requires an increasing use of intelligence.*

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* Dewey, John, ibid., page 74.
** Dewey, John, ibid., page 74

Dewey traces this second stage from games to work, and makes a distinction between these two and play. This is simply: "What differentiates it (work) from more spontaneous play is an intellectual quality; a remoter end in time ---.** It is just this seeing of purpose by pupils in what they do that we seek in order to secure effective learning in school.

"Work --- covers all activities involving the use of intervening materials, appliances, and forms of skill consciously used in achieving results. It covers all forms of expression and construction with tools and materials; all forms of artistic and manual activity so far as they involve the conscious or thoughtful endeavor to achieve an end. They include --- painting, drawing, clay modeling, singing --- manual training, work with wood, metal, textiles, cooking, sewing, etc. so far as these involve an idea of the result to be accomplished (instead of working from dictation or an external model which does away with the need for thought). They cover also the manual side of scientific inquiry, the collection of materials for study, the management of apparatus, the sequence of acts required in carrying on and in recording experiments."*

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* Dewey, John, ibid., pages 75-76.
** Dewey, John, ibid., page 79.

The third and highest stage or learning level, Dewey describes as follows: "So far as this latter interest - the interest in discovery or in finding out what happens under given circumstances - gains in importance, there develops a third type of interest - the distinctively intellectual interest. The intellectual interest is not a new thing, now showing itself for the first time. Our discussion of the development of the so-called physical activities of a baby, and of the constructive work of children, youth, and adults has been intended to show that intelligence, in the form of clear perception of the result of an activity and search for and adaptation of means, should be an integral part of such activities. But it is possible for this intellectual interest to be subordinate, to be subsidiary, to the accomplishment of a process. But it is also possible for it to become a dominating interest, so that instead of thinking things out and discovering them for the sake of the successful achievement of an activity, we institute the activity for the sake of finding out something. Then the distinctively intellectual, or theoretical, interest shows itself.[*]

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* Dewey, John, ibid., pages 80-81.

"It is the business of education to see that the conditions of expression of the practical interests are such as to encourage the developing of these intellectual phases of an activity, and thereby evoke a gradual transition to the theoretical type."[**]

In Dewey's view the approach to effective education accepts a dichotomy of practical and intellectual activity, but these are complementary and overlapping. He sees the school's role to be that of deliberately moving from the one toward the other. How far any one learner, or even most learners now or in coming generations can move along the continuum he does not hint at, nor can any of us know for sure. The challenge to the schools is clear, however, to so plan its programs that movement along the scale occurs as rapidly and over as great a distance as possible for each individual learner.

Dewey to a certain extent by-passes the content vs. method conflict. He says at one point only: "The problem of educators, teachers, parents, the state, is to provide the environment that induces educative or developing activities, and where these are found the one thing needful to education is secured."* Presumably by skillful environment arranging necessary content can be acquired even though primary focus is placed upon process. This, it should be noted, is a reversal of the traditional or even current emphasis as between the two.

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[*] Dewey, John, ibid., pages 81-82.
[**] Dewey, John, ibid., page 83.

Dewey resolves the individualization vs. socialization conflict. (See pages 84-89.) And he also relates social interests to moral interests so as to largely subsume the latter within the former (See page 88).

Conclusion

If we summarize the foregoing, two basic ideas are apparent. In the first place, there is a very considerable difference between developing an ideal canning tomato for California and producing an ideal 19 year old American citizen. (This is said in spite of a recognition that in current slang girls are sometimes referred to as tomatoes!) Specifications for the ideal canning tomato can be rather easily agreed upon: uniformity of size, shape, color, meat quality, and maturation pattern. No such agreement is possible about the ideal young citizen. Parents, teachers, and pupils values differ widely and the inherent great differences among the pieces of raw material militate against precise uniformity of treatment and final output.

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* Dewey, John, ibid., page 96.

In the second place, even if agreement could be reached as to what we seek as the ideal 19 year old citizen, the kind of school institution and program to develop him certainly still has not been finally agreed upon. Educational practices are not so precisely certain as to outcomes as are industrial and olericultural procedures.

In short, there is substantial justification even yet for serious attempts to develop new and unorthodox rational patterns of educational programs to meet the identifiable special needs of either an individual pupil or groups of pupils in the high school.

PROJECT FOR A MODIFIED APPROACH TO HIGH SCHOOL LEARNING

The Problem of the "Misfit" High School Pupil

Even though we ignore what may be important implications of the foregoing for reform of the first ten years of the American public school system, we can turn anyhow to a consideration of what can be done for those pupils who by this time, although they undoubtedly have gained much from their schooling, are disenchanted with further high school attendance. There will be almost as many theories as theorists at this point, and undoubtedly there should be many approaches explored with quite an array of successes ultimately to be further developed and perfected. Some may well be other types of institutions than we now include in our concept "schools".

In this quest for individual significance in our demanding modern American society, each pupil should be given special consideration by all with whom he comes in contact. And for each pupil a peculiarly individual school program should be devised. Each individual pupil, theoretically at least, requires a unique program of schooling. Here the concept of Mark Hopkins and a single pupil at the other end of the log comes to mind.

In actual practice, however, we must find if we can, sufficient numbers of pupils with similar interests to provide workable class groups in order to fit a specialized program into the established institution. Then within the groupings, as indicated previously, everything possible must be done to individualize that generalized specialized program to meet the unique needs of particular pupils. Many techniques for achieving this individualization of instruction within our mass educational system are, of course, in everyday use in good high schools everywhere.

If we project the problem of tenth graders who see little or no meaning for them in further high school enrollment against the backdrop of what was developed in the introductory section of this report, two main ideas protrude. The first is that by tradition "good" schooling has in general been conceived of as being chiefly bookish, verbal, rather rigidly structured in content, and abstract and intellectual in nature. The second is that what is undertaken in much of the high school program is imposed upon the learner based upon criteria external to him and his concerns. As the couplet goes:

I'm a problem to my teacher 'cause
With curiosity I'm cursed,
I'm interested in many things, but she says
I must complete my education first.

When all is said and done, no matter how great the ingenuity or determination of the staff, pupils in a comprehensive American high school begin with widely varying abilities and interests and end up with those same widely varying abilities and, of equal importance, with widely varying accomplishments at the end of their school periods. It is obviously improbable that anything will ever be able to change this completely, in spite of some recent startling predictions about ways to achieve learning. But we need to go further than this: it is wonderful that this is the case! We should in school practices not only acknowledge the fact of individual differences among pupils, but hail this as perhaps nature's greatest triumph. What a drab world this would be were it peopled only with valedictorians!

There is a great wonder about one human attribute: our seemingly almost limitless capacity to adapt. There is a paralleling cause for tremendous concern, however: the danger that we will adapt rather than resist when basically important matters are at issue. Accordingly, we must permanently be seriously concerned in school about the development of both adaptability and conformity, and of variability and non-conformity.

The total formal offering of a high school and especially if it be a "comprehensive" high school is composed of a bewildering array of courses or specialized curricula with inherently and presumably accepted different achievement ends for the pupils enrolled. Some courses everywhere perhaps have fairly clearly discernible aims and hard-to-dispute content such as beginning typewriting and shorthand, first semester mechanical drawing, or beginning band. Others however, have necessarily vague goals such as English literature or French VI or American history and government. Between these two extremes all the other offerings theoretically fall somewhere along the scale.

In most high school courses there is room for wide variations in outcome expectancies by pupils, teachers, parents, employers, and others. The happy school emerges when a large (or at least as great as possible) concensus exists among these constituents as to the purposes of the total high school program and each of its offerings. Counselors reinforce each other in their advice and actions; the grading system has common meanings; and parents, pupils, and staff communicate effectively as each tends to his own task.

By the time most American high school pupils have reached the tenth or eleventh grade they will have found the school program as offered either substantially satisfactory or unsatisfactory for the realization of their purposes. Pupils will have been exposed to some variety of elementary school program, either flexibly or inflexibly adapted to their abilities and expectancies.

They also will have participated in a departmentalized program of a few years duration that again either acceptably or unacceptably fits his needs as the pupil sees it.

Through this entire period of eleven years or so of schooling, pupils will have been exposed to all of the pressures of this in- and out-of-school environment and the traditional educational value systems. If at this point (and earlier of course for many pupils) the pattern of schooling is not acceptable to them, some substantial common stock-taking by them and their parents and the school cooperatively and collectively is required to make further schooling worth the time and money involved. Unless this is done further school attendance presumably has little value for the student, and not only constitutes waste so far as pupils are concerned but also represents an encumbrance upon the high school that reduces its effectiveness for other pupils. The almost certain deterioration in attitudes and relationships that ensues among the parties accentuates and aggravates the substantive loss.

For pupils who at this stage of their schooling see little or no value in what they are doing in high school, something akin to a salvage operation is necessary.

The American mass educational system that has evolved which may suit many or even most pupils clearly does not suit all. And hortatory endeavors at this point will have little effectiveness with those pupils who straggle at the end of the procession. What is required for them is a substantial rearrangement of the educational structure so that these pupils see once again some personal value in what they do in school.

So here (although it has all along been just as appropriate) the peculiar goals, interests, abilities, and current educational status of each pupil need to be closely analyzed and appraised. Based upon this analysis a new approach and appeal to his interests must be made by the school offering if it is to secure desirable results. This approach to reach him now may well require the abandonment of some, most, or all of the traditional patterns of high school operation. All that is certain in any case is that these patterns as they have operated up until now have not succeeded well for some pupils.

At this point a new relationship between the two basic purposes of the American comprehensive high school must be sought for these pupils i.e. socialization and individualization. And now the closely supportive nature of the two goals becomes quite apparent.

What is substantial for the individual in society in general is also substantial for society itself. The basic problem of the high school from the start has been to set up a program to meet both the socialization function and the individualization function in such fashion as to make what is done in school genuinely and continuously meaningful for each pupil. Whatever failure exists in meeting this problem fully in general or in a particular high school grows in large part out of the handicaps posed by traditional concepts concerning what is "good" education and how it may best be achieved. Beyond this is the already noted overwhelming task of meeting the needs of the full gamut of interests and abilities represented by the enrollees in a typical American comprehensive high school with available resources.

Conjecture about the nature of differences among the interests and abilities of individual learners is a fascinating enterprise. The complete gamut of possible and known variations probably never has been or can be developed.* But if one deliberately were to attempt to select an opposite to that which the traditional high school program emphasizes, i.e. the scholastically intellectual, probably the best choice would be that of the manual. Hand vs.mind is a well recognized opposition as already noted, with extensive quotations previously given from Dewey to explore the nature of the two, their contrasts and relatedness.

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*Dewey, John, ibid. page 67: "The kinds of activity remaining as true educative interests vary indefinitely with age, with individual native endowments, with prior experience, with social opportunities. It is out of the question to try to catalogue them."

These contrasts and inter-dependence need not be further labored here. It seems entirely logical to believe, however, that if the dichotomy exists in pupil abilities and concerns, then some real differences in the appropriate educational programs to best achieve top results in both areas should be found. And if there be this opposition in the two approaches to life and learning, and if educational programs that are in some ways antithetical are appropriate for the development of each, then among the discontents with high school as it typically exists should be found some who have predominately mechanical leanings rather than intellectual ones. It can be argued on this basis that the overwhelming focal emphasis upon the intellectual in most of their preceding high school programs may well be a major factor in their dissatisfaction with schools up to this time.

The Proposal

It seemed desirable therefore to explore that idea further, and if possible to put it to the test. Accordingly a proposal was made to the United States Office of Education to explore the possibilities of finding some high schools willing to undertake such a venture.

The idea was to plan an offering in each participating school whereby the non-intellectual abilities and interests of some selected pupils who were not doing well in high school, during their tenth year of schooling, became the focal point of orientation for about half of their next year's program. There were several important considerations in this plan.

First, a group of pupils was to be sought in each school who had mechanical interests and abilities which had not been previously adequately exploited by their high school programs. These pupils thus possessed salvable potential; they were not merely castoffs. Second, there was sufficient time remaining in their high school careers to make a new offering before graduation realistically significant in scope and meaning, and a new inspiration, if engendered, productive of substantial achievement in their present school institution. And third, the traditionally intellectual content for this year of schooling was to be determined by, flow out of, and be basically related to individual learner's purposes as opposed to being set in advance on some external selection criteria.

The general notion proposed was for a daily block of three periods of time to be scheduled for each group of 20 to 30 pupils with as much of this time as possible being in the shop, and with three (or more) teachers being assigned to the class group as a team to work together in designing the program and in directing the learning. It was suggested that one or two members of each team be a shop teacher, another represent math and science competencies, and another be from the field of English. As great concern was to be given, however, to the selection of teachers sympathetic to the general idea of developing content from student special interests and abilities, and to innovative patterns of directing learning especially through teacher group enterprises, as to their subject area competencies.

In approaches to the discussion of the proposal with superintendents, curriculum staff members, principals, and teachers no more rigid pattern than the foregoing was proposed. It was thought that in an experiment of this sort, local adaptations and variations would be both inevitable and desirable. It turned out that this practically and realistically was even more important than was initially conjectured. In planning innovative programs, open-endedness of proposed design is a basic essential.

An extensive library search was made of the recent literature on team teaching and other related innovative practices for modified high school pupil and staff development. A selected bibliography of relevant references appears as Appendix A of this report.*

The effort to find high schools to become involved fell into three distinct patterns: First, an exploration was made in three eastern cities - Washington,D.C., Baltimore,Md., and Philadelphia, Penn. Second, considerable time was devoted to visits to all of the high schools involved in a San Francisco State College study of vocational-technical programs based upon the so-called Richmond Plan. And, third, work was undertaken in the Santa Cruz County school system and its three high school districts to develop exploratory programs in the three contained school districts and in the junior college.

PROJECT CENTERS

Three Eastern City Systems. The approach in the three eastern school systems was made because of then existing relationships of the principal investigator with school studies in each of the communities. A comprehensive school survey of Philadelphia was just being completed, a study of long-range school facilities requirements was under way in Baltimore, and planning for a new terminal vocational school had just been completed in Washington.

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*This task was largely delegated to A. Lucille Hansen, a graduate student at Stanford.

In each case after exploration of the possibility of engaging in a meaningful involvement in this project it was decided that this was not feasible at that particular time. A major reconstituting of the school organization in Philadelphia was just being launched. There was a totally new Board of Education, a new superintendent, and substantial internal administrative reorganization. There was no prospect that without close contact between the school system and the project that any substantial development could be expected. The prospect of beginning a program in one of the junior high schools was interrupted by the transfer of its principal.

In Baltimore the problems of school plant evaluation and ultimate major replacement of existing buildings to meet changed educational needs was found to be only one of the critical issues facing the school system. Subsequent developments during the ensuing year substantiated the soundness of postponing any such undertaking as was herein contemplated.

In Washington,D.C. similarly the school situation was undergoing severe strains. An extensive evaluation by an outside survey team of the entire educational program was under way. In addition the relationship of the public school program, a modified trade school program, and a proposed college for the District was under discussion, along with many internal problems of District of Columbia governmental and school reorganization.

In short, in none of these school systems did it seem auspicious to undertake at long range from California any involvement at the time. In all three, however, it still seems quite possible that a future exploration of the matter might well reveal a promising opportunity to undertake a venture of the sort herein proposed in any one or all three of these school systems.

Bay Area Richmond Plan Project

At the beginning of this enterprise it was discovered that a major project in the Bay Area was already under way that had important relationships to our operation. It was based upon the so-called Richmond (California) Pre-Engineering Technology program.

In 1962, in Richmond's De Anza and Harry Ells High schools, somewhat comparable programs to that proposed under this project were inaugurated. Groups of underachieving eleventh and twelfth grade pupils, but with good potential and interest in science, were selected to participate in a new Pre-Engineering Technology program. For these two groups of pupils much the same pattern as proposed for our shop-centered project was followed. Teams of teachers representing competencies in science and math, English, and shop collectively planned a half-day schedule. These programs aimed at resparking pupil interest in school attendance and application by centering upon these pupils' science interests, with English, math and shop related to facilitating achievement in science. Shop was not the central focus but served only a subordinate and supporting role to the science concentration. It was expected too that a considerable proportion of students would continue technological training beyond high school.

These programs were so successful in rekindling pupil interest and effort in school learning and with teachers, parents, etc., that comparable programs were added in El Cerrito and Richmond high schools as well. There are but four high schools in the Richmond school district. The program differed somewhat from school to school, but in basic concept was identical in all schools.

Based upon the success of the program especially at Ells and De Anza, plans now are under way to develop a Technologico-Cultural Comprehensive High School for Richmond. This institution will proceed along the same general lines basic to the original Pre-Engineering Technology program, but include other specialization as well. Two of these have been conceived and developed in some depth: Para-medical Technology, and Communicative Arts Technology. A new high school plant to accommodate this new type of program has been preliminarily planned with involvement of the Stanford School Planning Laboratory, and some financial support from the Ford Foundation.*

Based also in large part upon the success of the Richmond plan in De Anza and Ells High Schools, a _Center for Technological Education_ was established at San Francisco State College through a grant from the Ford Foundation. The general purpose of this Center was to expand the Pre-Engineering Tech program as developed in Richmond high schools to other high schools. The staff of the Center came in part from the Richmond school system.

By April 1966, 13 high schools in ten school districts were engaged in actual Pre-Tech programs. As a major part of our project, visits were made by one or more of our staff to each of the 13 high schools and a general description was secured and a general appraisal made of the various programs.**

By the fall of 1967, 45 California high schools have developed Voc-Tech programs with relationships to the San Francisco State College Center, and services from the

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* _Educational Specifications for a Pre-Tech Facility_, Richmond Unified School District and School Planning Laboratory, Stanford University, 1967.

** Much of this task was the responsibility of Calvin M. Watness, a graduate student at Stanford University.

Center are being provided to several other state systems that are developing comparable programs. These include Oregon, Mississippi, New York, and Michigan. The present Director of the Center currently is on leave to work in part on the extension of the Voc-Tech plan through services from the United States Office of Education in Washington,D.C.

The interest of the Office of Education in the Richmond Voc-Tech plan led also to the funding of an evaluation study by the Stanford Research Institute of Menlo Park, California. This study is aimed at a comprehensive evaluation of the outcomes of Vocational-Technical programs in depth. Nine schools are being extensively studied and a finel report is expected to be completed by February, 1968. One of the nine schools being evaluated is San Lorenzo Valley High School whose program is reported upon in a following section of this report.

Another grant from the United States Office of Education had potential important relationships later to our project. This is the study of Vocational Flexible Scheduling being made by the Stanford University School of Education. At the time of our study there were no high school programs sufficiently advanced in their planning or operations under this program for useful visitation for our purposes.

The impact of the foregoing enterprises was important in the planning of programs in Santa Cruz County. Findings with respect to the interim success of the thirteen Vocational-Technical high school programs undoubtedly has, substantially affected the general conclusions offered at the end of this report.

Santa Cruz County, California

The major locus of this project has been in Santa Cruz County, involving the office and staff of the County Superintendent of Schools, the three high school districts of that County, and less directly the Cabrillo Junior College which serves the entire County area.

In 1965, a study was made for the Santa Cruz County Board of Education of vocational education programs and facilities of the high schools of Santa Cruz County. Accompanying and following this study and the ensuing report,* an extensive program to coordinate and extend vocational education offerings in the high schools and junior college of Santa Cruz County was undertaken by the County Office. Norman S. Lien, County Superintendent of Schools, provided direct leadership in the program. Supporting him were James Eachus, Assistant Superintendent and Director of Educational Services, Joseph A. Benedict, Director of Curriculum, and later, Lawrence Edler, Director of Vocational Education.

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*Career Development Education in Santa Cruz County, June, 1965, Odell MacConnell Associates, 750 Welch Road, Palo Alto, California, 94304

The general scope of this vocational program in Santa Cruz County has been continuously expanding during the years 1964-1967. Its development has been financed, in addition to local district general funds, by federal and state grants to the County Office and from County funds secured from annual requests by the County Board of Education to the County Board of Supervisors. This latter source of funds provided the real impetus for the expanded program and represents a unique leadership role by a non-industrial area county school system in California for a coordinated program of vocational education.

In this whole concern about an extended vocational program, most other county groups either gave direct support or were sympathetic. In particular the Santa Cruz County Board of Education and the Santa Clara County Board of Supervisors were fully committed to the plan. In addition the high school districts and junior college district Boards, superintendents, principals, and staffs were fully concerned and involved. No attempt need be made here to identify all of those who were responsible; it is important only to note that what happened resulted from substantial support by all having concerns over the improvement of the educational program.

The first year's County program in 1964 provided funds for each of the three high school districts to release teachers to coordinate vocational programs in their respective districts, to develop work-experience programs, and to assist in improving vocational counseling programs. The County-wide program, centered in the County Office, included the development and dissemination of vocational materials, and the development of coordinated approaches to the vocational programs among the three high school districts and its personnel and with the junior college.

In succeeding years, with increasing resources, these programs have been continued and expanded. A County-Wide Vocational Advisory Committee was created, a centralized county-wide high school graduate follow-up plan was initiated in the County Office, increased vocational counseling materials and services were provided from the County Office, etc. A Manpower Survey of the Central Coast Counties, including Santa Cruz County, was made in 1966 by the California Department of Employment in cooperation with Central Coast Counties Industry-Education Council. This provided better basic data for all concerned with respect to job needs.

An expanded program of vocational offerings has occurred simultaneously at Cabrillo College. In 1967 as a result of the continued cooperative planning for meeting the needs of high school pupils in the County, a program was developed to transport pupils daily from all high schools to the Junior College campus for offerings in electronics, radio and T-V, and gas engine mechanical services. Continuous expansion in the general program of vocational offerings occurred as well at the College.

Adult evening programs in all districts expanded during the period.

In all of these enterprises, Wesley Smith, Director of Vocational Education, California State Department of Education and his staff cooperated fully and sympathetically.

Within this general pattern of school district expansion of vocational programs was included the concern of this team-teaching project. This obviously had not been the original expectancy but it was a sort of fortuitous relationship to be exploited. So from the beginning the idea of special offerings for pupils who were experiencing non-success in high school was included in the various high school programs. Accordingly in the County allocations of funds to the three high school districts were included items to initiate and implement team-teaching exploration.

Two summer workshops were held, the first in 1966 and the second in 1967. These were titled Santa Cruz County Technical-Vocational Workshops and were each scheduled for four weeks duration. These were conducted in cooperation with the San Francisco Center for Technological Education. A number of consultants from the State Department of Education, the Richmond School System, the Center, and elsewhere participated. The principal investigator for this project was involved especially in the initial Workshop.

The general Workshop schedule was: first week general orientation to underlying concepts of team-teaching and of vocational tech programs, second and third weeks teams working in respective districts in planning and developing individual team projects, and fourth week general exchange of ideas and progress results among the various teams.

Each of the three high school districts had groups participating both summers. These included the teaching team, counselors, work experience coordinators, and others. The Workshops were held at Cabrillo College in part to emphasize the singleness of purpose among the programs and the totality of the County vocational program as a whole.

To facilitate these Workshops, County funds were provided to each of the three districts to pay six teachers and counselors for their month's participation. Other funds, either County or local district, were allocated to facilitate regular school year team planning.

In each district determination of the pattern and scope of the team teaching undertaking was largely determined by the individual school principal and staff. Frequent group and individual conferences were held by County staff members and by the principal investigator of this project with superintendents, principals, teachers, and other staff members including the special personnel provided through the vocational education grants. The concepts of the Richmond plan and of the proposed shop-centered team teaching enterprise basic to this project were repeatedly examined, explored, and discussed. But as must be expected, in the final analysis the particular form each district program took was substantially determined by the individual school principal and staff assigned to the task. As will be seen next, each school district developed a significantly different approach.

Common in all three school district programs, however, were the basic concepts of this proposal. All three school systems attempted to find a more challenging approach to meeting the needs of a group of non-achieving eleventh and twelfth graders through a joint effort of a team of teachers representing various subject fields. The variations that developed were within this common framework. Each had as a necessary component as well the conviction that what was being developed was vital to the particular school and some selected pupils and for the team members individually and collectively.

The part the County Office played in this project was necessarily supportive only; the actual determination and shaping of specific team-teaching enterprises was determined by each school district upon its own.

Watsonville High School. The Pajaro Valley School District was recently unified in 1963 by combining the two Watsonville school districts with six other surrounding elementary school districts. A new school board was created, and it selected the former Watsonville superintendent of schools, Mr. Glen D. Smith, as head of the newly created district. Within two years, he was succeeded by another superintendent, Dr. James Runge. During the past four years, therefore, there have been extensive organization and financial problems arising out of the newly created district structure.

The Watsonville high school enrollment has steadily increased and the school currently is badly overcrowded. One of the perplexing problems in the area during recent years has been the determination of the best location for a second high school.

During this period, however, there has been concern at Watsonville High School over improved programs for non-achieving pupils and for pupils with discernible special vocational interests not well served by existing programs. Kenneth McCombs, Principal, and Mr. David L. Peterman,Vocational Counselor, both have exerted effective leadership in the development of the offering.

A special agricultural cooperative work-experience program for a few interested boys was developed in ornamental agriculture three years ago. A Floriculture Advisory Committee was created and field activities have been carried on at the local high school grounds and at Hyde Elementary School within the district. Some of the graduates appear interested to carry on their activities later at adjacent junior colleges outside the County. The boys involved were general non-achievers and were considered to be likely high school drop-outs.

Another program for a group of girls with poor achievement and school attendance records was developed with home economics vocational funds support. It was designed as a cooperative work program to develop Homemaker Assistants. Local housewives took responsibility for supervising work in their homes for these girls for the equivalent of one or two periods daily. A home economics teacher developed and managed the program. Preparation headed toward employment in motels, nursing homes, and private homes. Roundtables with housewives, counselors, pupils, and the principal facilitated the program's operation. Improved grades and school attendance by the enrollees reportedly are resulting from the project.

From the Santa Cruz County program funds were provided for a Vocational Counselor. Besides this, early in 1966 a survey was made of teachers in Watsonville High School concerning their interest in inter-disciplinary instructional techniques. Over 30 per cent of the teachers responded with expressions of interest and belief in this need for the school.

Following this it was determined to establish a first activity of the sort in the Para-Medical field with emphasis on health occupations. Accordingly five teachers and the Vocational Counselor were assigned the task of developing a program. Extra after-school time was paid for during the year and the group attended the first Santa Cruz County summer Workshop. Two weeks were spent by the group at the Fort Ord Medical Hospital.

The team was composed of one science and math teacher, a business teacher, a home economics teacher, and an English teacher, along with the Vocational Counselor.

The two year course ultimately was named Health Occupation Preparatory Program. Approximately 30 girls were rather carefully selected for the program initially with explicit patterns set for the determination of those who should enroll. In general these pupils were underachievers with average or above ability without serious behavior or attendance problems. Their sophomore teachers evaluated them on a rating sheet, and SCAT, D.A.T. clerical, and the Strong Interest tests were used for general added background information.

In developing the program exploration was made for relationships with the adjacent Fort Ord medical facility operations program, with existing junior college programs, etc. Possibilities of both immediate employment, and continuing junior college education as dental technicians or assistants, dental secretaries, practical or registered nursing, etc. were given consideration.

The program of studies for the first year's offering is included in this report for additional information. It is still too early to attempt to evaluate the plan.

Consideration was given by the Superintendent and the staff to the possibility of developing a shop centered team teaching program at Watsonville High School. Space appeared unusually favorable in the largely unused vocational agriculture shop and in the adjacent other large shop areas. But crowded enrollments, among other factors, led to subdivision and rearrangement of the agriculture shop areas and to postponement of this new offering. It still seems possible however, that such a project might be developed later when the new high school is in operation and space relief comes to Watsonville High School. In the meantime experience with offerings for special groups in agriculture and homemaking, and with the team teaching enterprise in the health field should facilitate later even more effective offerings for comparable poor achieving groups with other special interests and abilities, including shop and mechanical skills.

Watsonville High School

HEALTH OCCUPATIONS PROGRAM
PROGRAM OF STUDIES--JUNIOR LEVEL (First year)

In periods three through seven there are five subjects offered in the same block of time alloted for the usual four subjects (plus lunch). This will be accomplished as shown in the following chart. Note that certain subjects are offered in two period blocks; in this way considerable set-up, tear-down, and passing time is saved. This schedule also results in each subject teacher having one extra counseling period per week so that individual help may be given students as needed.

For the Junior year, science credit will be listed as "lab science" and for the Senior year, it will be listed as "chemistry".

<table>
<tr><th>Per</th><th>Monday</th><th>Tuesday</th><th>Wednesday</th><th>Thursday</th><th>Friday</th></tr>
<tr><td>1</td><td colspan="5">History or Physical Education</td></tr>
<tr><td>2</td><td colspan="5">History or Physical Education</td></tr>
<tr><td>3</td><td rowspan="2">Nutrition</td><td rowspan="2">Lab Science</td><td rowspan="2">Nutrition</td><td rowspan="2">Lab Science</td><td>Math</td></tr>
<tr><td>4</td><td>Lunch</td></tr>
<tr><td>5</td><td colspan="4">Lunch</td><td rowspan="2">English</td></tr>
<tr><td>6</td><td>Math</td><td>English</td><td>Math</td><td>Math</td></tr>
<tr><td>7</td><td>Typing</td><td>Typing</td><td>English</td><td>Typing</td><td>Typing</td></tr>
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Santa Cruz High Schools. The Santa Cruz City Board of Education is responsible for conducting the affairs of two school districts, one elementary and the other secondary. The high school district covers more than the city area proper and therefore must provide high schools for more than the city elementary school system alone. Possible and desirable school district reorganization within the area has been under constant study in recent years. The problems of financing education in the high school district in particular have been a major perplexity. This has resulted in defeated school financing issues, contested Board elections, and administrative reorganization necessities.

For the current school year 1967-68, high school district operations are on a greatly reduced pattern. The continuence of existing experimental high school programs has of necessity been curtailed, and the prospect for new programs soon is not promising. Superintendent Denzil A. Morrissey, Principals Aaron Nelson and Robert Soderholm, and Work Experience Coordinators Peterson and Faitos were concerned to develop new programs in Santa Cruz high schools. County funds were provided as for the other two high school districts, for vocational counseling and work experience staffing. Because of its larger size, the equivalent of two positions was provided each year for Santa Cruz. Much effective work was accomplished by these and other staff members.

Several conferences were held with the Superintendent and the high school principals and other staff members concerning the possibilities of team teaching projects. It appeared initially especially promising to develop a shop centered program at Santa Cruz High School because of the existence there of exceptional shop areas.

The high school principals explored these ideas with their staffs, and it was decided to constitute a team at Santa Cruz High School to plan a project. Only three representatives found it possible to participate in the first County Workshop: one counselor, one English teacher, and one shop teacher.

The group had decided upon an approach that emphasized the Humanities and the program was based upon a series of units or projects. The first of these centered upon the concept of Play. Activities included studying about child development, the nature of games, and the actual making of toys in the shop and art room. While the interest in content was not ignored, the basic concern was in finding through method an approach to revitalized pupil interests in learning and feelings of school significance.

Fifteen tenth and eleventh grade pupils were selected for the project. These were non-achievers but they were to possess potential for much better school achievement than was being realized. No more specific pattern for selection was established. All four high school counselors participated in the selection of whom only one had participated in the Workshop.

A science-math teacher, an English teacher, and an art teacher, two shop teachers, and a counselor were actively engaged in the team teaching activity. The group met for a planning period each day during the first semester 1966-67. County funds provided the equivalent of one teacher to make this possible.

The course began mid-year and continued for the semester. The course was scheduled for one hour daily, with activities largely centered in the art room and in the wood and auto shops.

Due to the reduction in staff for 1967-68 the project was terminated, although the principal believes it might be reinstituted later. But the loss of seven teachers, two clerks, one counselor, and 1/2 Dean with a net increase of 75 pupils for the year militates against including any program that requires special staffing. Furthermore only substantially reduced funds are available for supplies and materials. Some of the pupils are continuing this year upon an incidental basis with individual teachers from the team to develop discovered interests

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arising from the project. One became interested to continue in the study of child psychology, and another is writing a children's book.

In spite of reduced resources, planning has gone forward for prospective new programs at Soquel High School. A team of shop math, English, science teachers, and a counselor participated in the 1967 Santa Cruz County Workshop. A pilot one period per day Construction-Technology program for 30 pupils has begun this year. It is proposed that this be extended, if successful in succeeding years into two or three periods daily. The focus is upon preparation for the building trades: carpentry, plumbing, masonry, electricity, etc. In the selection of pupils for the program "interest in carpentry" dominated.

Other possible programs also are under consideration for later adoption in the Soquel High School programs particularly in the field of aviation, medical, foods, marine technology, and hotel-motel services.

San Lorenzo Valley High School. This is a comprehensive four-year high school near Santa Cruz enrolling approximately 650 pupils. The then Superintendent of Schools, Dr. Richard R. Fickel*, became interested in the prospect of extended services to pupils whose needs were not being well met by the existing high school program. He strongly supported the proposal that County funds be provided for new programs, and as soon as these funds became available recruited Mr. John P. Pennington as Vocational Director for the district. The then Principal Provart* was as supportive of new programs for pupils as the Superintendent, and these three men recruited other staff members and provided most effective leadership from the outset.

An extensive Work Experience Education program was developed with 120 pupils involved each semester during 1966-67 in inside school system activities, and another more than 30 in outside positions. This represented about 20% of the entire school enrollment. Another 39 pupils participated in the school system Work Study Program. An expanded occupational information program also was developed and operated and an offering in home economics was reestablished.

Space and financial problems existed in this district as in the others already described. In particular the shop facilities were extremely limited. In spite of these handicaps and that of a small student body, immediate plans were made to develop a new offering. A team of teachers participated in the first County Workshop and developed a plan for a San Lorenzo Interdisciplinary Instructional Program (SLIIP) that was inaugurated in September 1966.

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* Dr. Fickel has succeeded County Superintendent Lien, and was succeeded in San Lorenzo by now Superintendent Provart.

This program enrolled 19 junior and senior boys in a four subject interrelated program. These subjects were mathematics, English, physics, and shop. Each pupil enrolled in physical education and U.S.History or Civics as well. One teacher in each specialization, a stand-by teacher of art, and a counselor worked consistently on the program. These teachers had a common extra preparation period throughout the year.

The boys were selected on the basis of four criteria:

1. Each boy was an under-achiever as judged by his ability test scores and the opinions of his previous teachers.
2. Each boy had completed one-year of algebra, but with no specified degree of success.
3. Each boy had a reading level of at least grade 10.
4. No boy was a chronic disciplinary problem.

The concept of the program was that there would be close cooperation among all the teachers to provide relevant experiences for each pupil in the group, with as much interrelatedness among the subjects as possible. Besides content accomplishment (three teachers were "academic") concern over attitude toward school activity was kept constantly in mind. Extensive evaluation and interchange of attitudes toward the program was conspicuous throughout. Questionnaires were developed to probe these matters, and an evaluation was made at the end of the first five weeks and also at the end of each quarter-year.

The program was scheduled for the group as a unit, with English and math in the morning, and physics and shop in the afternoon. The science lab, however, was cleared for use by this group for two periods daily, and the shop was available for an extra period at the close of the school day.

One boy dropped out of the program after the first day and another after the first week. The other 17 persisted throughout the year. At the end of the year 6 seniors graduated. All of these continued their schooling at either the local junior college (5) or at a State college (1). One boy moved out of the district, but of the remaining ten boys, seven are continuing in a second year of the program. Two others transferred to the new business group and the eleventh boy returned to a regular program.

Considerable status for the group was realized through affiliation with a national student group - JETS - made up of pupils with like interests and in comparable educational programs.

A successor beginning group of 14 boys and 2 girls (an innovation for the program) are enrolled anew this current year for a program essentially the same as its predecessor.

As a result of the success of the technical program as judged by all concerned, a second team of teachers participated in the second County Workshop in the summer of 1967. The emphasis of this new offering was toward business occupations, and particularly with a merchandising orientation. The team was composed of two business education teachers, and an English, an art, and a home making teacher. The counselor and the vocational director again worked closely with the project. There are 13 boys and 11 girls enrolled in this new program.

In addition to the careful evaluation of the program by the San Lorenzo staff itself during the course of the first year of the interdisciplinary project, this project is one of the nine being evaluated in depth by the Stanford Research Institute as previously noted. That evaluation was most methodically planned and executed. The report of the Institute's study is to be ready probably by February 1968. At that time more information will be available than has heretofore been the case for similar or comparable enterprises.

The present evaluation, however, is most satisfying. The following are the conclusions reached and reported at year's end based upon careful reports from all pupils and teachers involved in the undertaking.

TEACHER EVALUATION

After our first full year of experience in the program, we note these strong and weak points and feel that the next year's program will benefit from our failures as well as from our successes.

The teaching team and most of the students are still enthusiastic about the program.

The interrelationship has become increasingly successful, with the Math, Physics and English teachers very pleased with progress. However, the Shop teacher still feels the need for improvement in this area. Perhaps the lack of materials and equipment has been a detriment here.

The team feels that the common prep period is absolutely vital to the success of the program. Even more time is spent in the course of the day than the one period allotted.

Most students have profited from the concentrated attention of four teachers. They have felt that the teachers are genuinely interested in them and have responded accordingly.

Pride in themselves and in the class is evident.

Probably the one greatest area of improvement in the students is in the area of self expression. All students can and do freely express themselves orally. Many of these students were non-communicators in previous classes.

Eight of the eleven junior members of the class wish to continue in the program next year. Two students have transferred to the Business Interrelated Disciplinary Program for next year, and one wishes to return to regular classes. Six of the six graduating seniors intend to continue their education next year.

A cautious appraisal of the program would indicate that it has been a success with all students in some areas and with some students in all areas.

The improvement of communicative skills has probably come about because this is the first time that adults have really listened to these students. Teachers, researchers, industrial representatives and others have shown marked interest in these students and their opinions.

These boys have at least average ability. If we have made a difference in their attitudes (they like school, have purpose,etc.) they will be able to become productive citizens.

STUDENT EVALUATION OF CURRICULUM

Throughout the year the teaching team has had its ears tuned to student reaction to the program work. Student reaction is as follows:

1. In classes where homework is given, the students feel it has some value, and that it should be reviewed in class.
2. They believe that problem solving, discussion, lab work, and boardwork are most beneficial to them.
3. They admit to not reading the textbook in math.
4. They feel that tests have much value in physics and little value in the other classes.
5. From the students' viewpoint, we are more interrelated than in February.
6. They believe the shop facilities are inadequate and feel that a course in freehand sketching and machine use should be given at the beginning of the school year to the Tech I group.
7. They feel the class work is going about right.

TEACHER EVALUATION OF STUDENTS

1. As a group, the students are average in accuracy, interest, enthusiasm, friendships, potential, conduct, neatness.

   They are below average in preparedness, initiative and homework.
2. We lost ground on preparedness, initiative, effort and attention, and this is more indicative of actual classroom behavior.
3. Three students were above average in all these traits, while four were below average.
4. We and the students agree that there is still a potential that is not fully developed.
5. Most of the students are doing an excellent job, even though a "Spring Slump" shows in their last quarter grades.
6. Almost all of the boys have participated in some out-of-school presentations to conferences, business groups, parents, etc.

7. A good part of the teaching team time still goes into counseling each other about the students.

8. One boy won the Lions' Club Speaking Contest. He has also been elected as Student Body president, an office he admits he would not have dreamed of without the confidence he gained in this program.

   One boy waged an unsuccessful, but good, campaign for Student Body vice-president.

   One student won the faculty award for the most outstanding senior in service to the school.

   Another student won the award for the most improved student in the entire senior class.

GENERAL COMMENTS

Outside researchers and observers have commented on the courtesy and behavior of this class when they observe them or speak to them. In comparison to other similar-ability students not in the program, they are described as noticeably more attentive, courteous, friendly and outgoing.

Their ability to speak up and express an opinion is remarked upon by many. Their forthright honesty is an outstanding characteristic.

The camaraderie of the group is great. Much social pressure on the individual comes from pride of the group. The one student who wishes to return to regular classes has not been able to conform to the standards of the group in matters of behavior, manners and general attitudes.

Several of the students have been out of line in behavior during the year. In no instance has this behavior been condoned by the group. The behavior is not perfect, but the same error is seldom made twice because the group, subtly or not, lets the offender know that he has been disgraced.

This group of boys has been literally in "a goldfish bowl" all year. The teaching team long ago lost track of the number of observers, researchers and visitors to the class. The boys have been remarkable. Few groups could have been so patient and have functioned so well under such trying circumstances.

SUMMARY AND CONCLUSIONS

Ingredients For Success The experience of working on an idea for substantial high school curricular or instructional reorientation has to be undergone to be fully appreciated or even partially understood. What follows nonetheless will attempt to set forth some of the conclusions about this process of high school program innovation and change, as well as conclusions about the specific concern of this project, i.e. manual skill oriented interdisciplinary team teaching of disenchanted high school pupils.

In the first place the amount of time required for planning and initiating any even apparently simple curricular or instructional change involving a group of staff members can scarcely be exaggerated. Even a two year exploratory and cogitating period for such a planning group might well be considered an essential minimum; certainly a full year of lead time is required.

The amount of planning and preparation time required as well as the ultimate successful smooth operation of the undertaking appears to differ considerably depending upon whether the driving force behind the idea is in close proximity to the project or is at a distance. Thus when the innovative concept comes from outside the local school institution, whether it be from a neighbor school, a college project Center, the superintendent's office, or from a university professor or consultant, there is considerable uncertainty that the planning and execution will move ahead smoothly and surely. And there is almost complete certainty that if the driving force does not rather soon find locus in the particular school institution (when it has been initiated externally) the innovation will falter and die anyway.

It is risky because of the complexities involved to put in a priority order the necessary forces to bring-off a successful high school curricular or instructional innovation. But it is clear that at the top of the list is the school principal himself. There was no other person in any of the schools who appeared to have the power to continue to clear the successive road blocks that arose and that inevitably will in such undertakings.

These blocks included matters that were both substantive and intangible. The substantive ones involved such items as the establishment and continuance of common preparation periods for the staff members involved, classroom and shop availability, continuance of adequate pupil recruits, provision of special materials resources and of funds for transportation and other unordinary needs, etc. The intangible ones included such matters as morale support, radiation of a general conviction of the substantialness of the enterprise and its worthwhileness, pressure for support from staff members and others not directly involved in the enterprise, etc.

It appears doubtful that an innovative practice involving a group of staff members can succeed in a high school where the principal is not highly supportive of the enterprise. Change and improvement have as natural drags against them institutional inertia and general resistance to change based upon the already reached balance of existing forces that have combined to create "things as they are". There is small chance that lasting change will come without continued force against the down-stream current by the person in immediate authority.

The second necessary component for a successful curriculum of instructional group innovation is a happily composed group of teachers and counselors. There seems to be no way to predict this or know for sure how to compose such a group. It appears rather to be a matter of best estimate of the matter by the principal and others, plus careful nurture and development of the planning program, coupled with a large ingredient of luck. The teams that appeared to be working well had certain common characteristics: participants had developed full conviction that the enterprise was worth extra effort and was sound conceptually, it was agreed that a team effort had satisfaction just as great as separate teacher enterprising and indeed provided some extra rewards, and that the modified method of instruction with content related more directly to pupil interests and values was entirely "respectable".

Some of the more successful teams included members who had not initially been "believers". Thus the extensive planning time referred to above, continuing close contact with those who are believers, and some tangible in-progress evidence of success by the undertaking all seem necessary in happy combination to solidify the group into a powerful committed team.

While the two foregoing components of success were considered as first and second in order, there is no doubt that both are essential elements for any substantial success. And survival of the endeavor clearly depends upon continued strength in both components.

There are to be sure other important elements for a successful operation. This list is long and any ranking of items in order of importance seems futile and of little consequence. Items that appear necessary, however, include the continuous application of required special resources both human and material, anticipatory sensitivity to specific patterns of careful planning needed in the particular locus to avoid opposition by concerned groups - parents, pupils, other staff,etc. -, unwavering support through good days and bad,etc.

It appears that another highly intangible factor works either for success or failure of the project. This might be termed the general climate that prevails within the given school community.

This element is difficult to appraise acutely, but some schools appear to be improvement oriented and tolerant, and others just the opposite. The ingredients that bring about a favorable attitude toward attempts for improvement are hard to discern. They certainly include however, such matters as administrative "leadership", the nature of local parental aspiration, past patterns of staff working relationships, developed and developing role relationships and attitude patterns of pupil groups,etc. All of these are highly intangible and hence no precise prescription involving their proper combination for best chances of success can be developed. But in choosing schools where innovation and change appears promising, it seems that there can be determined in advance with some assurance those where application of funds and efforts are better justified.

The impact of superintendent and Central office support, and of extra funding for the project are difficult to appraise. This is true too of outside-the-school encouragement and support from complementary agencies - county office, Center, university professor or consultant, etc. All of these obviously possess important facilitory impact and thus undergird the core group in their ability to plan and carry out their project. Funding for free planning time during the regular school year and for summer workshops is almost an imperative for any new extensive undertaking. But this appears to be only undergirding.

Final success or failure of any such enterprise apparently depends basically therefore, upon the effective commitment of the school principal and a team of staff members, upon well-used advance and continuing planning time by the team, and upon a generally supportive undergirding complex of other factors that capitalizes upon those two primary components.

Disillusionment-Success Cycle

An interesting phenomena was observed with respect to the operation of exploratory team-teaching projects of the sorts undertaken by the Richmond Plan high schools and confirmatorily in the Santa Cruz County high schools. This is that there appears to be a somewhat common sequence of events which transpires over a three year period in such an undertaking. This conclusion is advanced even though it is highly subjective in formulation.

The first year in the operation of an enterprise of the sort under consideration typically is a "glow" year.

The preliminary planning stage of whatever duration that preceded, typically was one filled with fresh delight at the prospect of something new and important to be done. Planning time, inspiration from others, and a general aura of support provides a welcome and often marked contrast to the pattern of the recent past with a developing resurgence of the feeling of significance in the task of working with needful pupils. Life becomes more worthwhile and teaching again seems highly important.

During the first year of operation realism develops. All of the difficulties implicit in a new undertaking appear. The pupils selected do not quite live up to anticipation, teaching units planned in advance turn out to be less than wholly adequate or successful, all team members do not fully live up to expectations and obligations, and the pressure of other school responsibilities mount up and compete for time and energy. Materials and facilities usually too are not forthcoming quite as proposed and either spoken or silent criticism from non-participant peers or others is easily sensed.

All in all this first year is an acid test. Only the hardy and the lucky survive. During this period confidence and steadfast resolve on the part of the principal, the team, and all supportive agencies is required for success. If preliminary planning was well done, if all concerned maintain full resolve, if emergencies and crises are firmly met, and if the basic concept was sound, then the project can move into its second year. Not all do so. For in this first year, the dedication of the principal and the team is fully tested, and their competence to work effectively together in a common venture making use of all resources available is substantially determined.

The second year, even so, provides a continuing difficult test of the project. If discernible success was achieved in the initial year, and if sufficient opportunity has been provided to make necessary adjustments in the undertaking, and if logistic factors are properly cared for, then all should go well.

But it is in this second year that the real test comes of dedication by the principal and team. It is easy at this point to yield to competition from other interests for the special provisions that initially have been made for this project. Scheduling difficulties make common conference periods for the team members easy to rescind, drop-outs reduce class sizes to questionable levels, finding a second group of pupils for a successor class proves more complicated than initially, continued support for special requirements accorded the group initially seem oppressive in the light of old and new demands within the high school, etc. The freshness of the idea likewise has worn off for all concerned, and the fact that even this great and good idea has its shortcomings becomes a realization. Often a team member is necessarily replaced by a newcomer who must be supported in his efforts to be as effective as his predecessor. Accordingly adjusted internal relationships and responsibilities among the team members must therefore be contrived.

If the project survives this second year test, and satisfaction and achievement are maintained then the prospect for its indefinite continuance is promising. Few projects seem substantially to survive this second year. And even though continuance occurs with a third year or longer, the price for successful continuance is eternal vigilance, determination, and resourcefulness. At any point one essential link in the chain can collapse and the whole enterprise come to an unhappy end.

Challenge to the Establishment

It appears that projects of the sort under review encounter some subtle obstacles that are difficult to discern and comprehend. One of these seems especially probable and poses an almost deadly threat. Admittedly this thesis again is highly conjectural and speculative.

The present pattern of scheduling high school courses seems to make it easy to gloss over failure of the school with a good many pupils. Realization of non-achievement and the necessity to face up to it is generally lost in large part through the half-year rescheduling pattern of pupils for new programs of courses. Easy availability of new subjects, usual non-persistence of pupils with the same teachers over any substantial length of time, and other factors make it easy for the unsuccessful pupil to float along barely discernible in the total flow of the mass of bodies through the institution. Responsibility and accountability for pupil failure under these circumstances are difficult or impossible to place even though counselors continually struggle with the problem.

One of the most interesting relevant sidelights from this study was the astonishing assertion encountered repeatedly, regardless of the size of the high school, that approximately only 25 to 30 pupils could be located who were appropriate candidates for this program. This was stoutly believed to be equally true for the largest and for the smallest high schools in the study. While the establishment of two beginning groups would have facilitated continuance of the program into a second year with better assurance of adequate class sizes, the schools involved seemed not to find this a real possibility. It was in San Lorenzo Valley High School the smallest of the group, that it was achieved without apparent undue concern.

The concept of a team of teachers becoming personally responsible for more effective and continuing learning by a particular group of pupils thus in a sense is antithetical to the pattern of high school institutional operation. It would appear, therefore, that the permanent survival of the concept basic to the Richmond Plan, and to the proposal for team teaching of a mechanically endowed group, may well depend upon the initial concept of a specially selected group being considered as only the beginning of a new pattern of high school pupil and teacher programing so that it be not a permanently inconsistent special case in a school. A special case, unlike the ugly duckling, can hardly be expected to come to a happy end if it must always be one against the many.

For ultimate success of the high school as an institution which does not shuffle its failures so they are lost in the mob, it would appear desirable to seek a new pattern of operation. This pattern would try to identify various groups of pupils with common needs, place them with responsible teams of teachers whose single concern would be to cater to the special needs of their own group over an extended period of time, and longer than one full year in most cases. Thus there would be continuity of program and of teacher-pupil relationships, constant and continuing appraisal of pupil success, and great flexibility in both content and method based upon predicted and developing pupil interest and success.

In an environment more generally favorable to the fundamental concept of the Richmond Plan or the mechanically endowed pupils programs of the sort now under way in these schools, it could be expected that they would flourish and prosper. If they are expected to stand alone however, and to be going the opposite direction on a one-way street, they can scarcely be expected to persist very long.

In short, the only good prospect for long-range survival, let alone victory, is that this experiment in better learning procedures for one group of high school pupils, be supported by other comparable and accompanying enterprises. Then the several efforts become mutually supportive, and by joining forces each reinforces the other. Only through a constant broadening the front and reinforcement with more troops (teacher teams) does the chance of making permanent headway against traditional patterns of high school operation become more realistic.

Another way of saying the same thing is that a little revolution is more difficult to sustain than a large one. Or that a small innovation, especially when it sharply challenges the general operation pattern of the high school, has best prospect for persistent survival when it can be steadily enlarged and thus be supported by companion enterprises with identical or compatible counter-establishment goals. In short, a sharp modification in practice to succeed, expand, and persist must be in a time and place where the success of the demonstration is recognized and then is broadened sensibly but significantly so that it can become part of an expanding assault on the tradition which it set out to challenge. A project thus turns into a movement. Movements may persist; projects rarely do over any period of time.

With respect to a more objective and comprehensive evaluation of the basic concept of this project in both the related Richmond Plan high schools and in the San Lorenzo Valley High School project, we can expect to get that soon from the Stanford Research Institute report. The final statement that can be made on the basis of our direct experience in this rather limited project, however, is as follows:

1. The effort to mount a program of the sort undertaken requires a longer period of time than was available and a larger commitment of staff for reconnaissance and coordination than was provided.
2. Schools for involvement need to be more carefully selected than was possible under this project.

3. Even so, substantial beginnings were achieved in all three Santa Cruz County school districts. In one school in particular, the San Lorenzo Valley High School, an exceptional program is being developed which appears to possess unusual promise of permanence. In two other high schools, Watsonville and Soquel, prospects are favorable for continuation of planning for future program extensions to meet the needs of non-achieving, non-intellectually oriented pupils.

4. The challenge of the sort posed by the central concept of this project is so extreme as to make it necessary to work more carefully over a term of years with special funding in a group of carefully selected schools for it to have best (or even a very good) chance of success in changing traditional and entrenched patterns of American high school operation.

APPENDIX A

SELECTED REFERENCES ON TEAM TEACHING and SECONDARY SCHOOL INNOVATIONS

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APPENDIX B

DIRECTORY of PARTICIPATING and RELATED PERSONNEL and PROJECTS

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2. Center for Technological Education
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George Champion, Director

3. Evaluation Project in Pre-Technical High School Programs
Harry V. Kincaid, Senior Research Sociologist
Stanford Research Institute
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4. Flexibility for Vocational Education Thru Computer Scheduling
U.S. Office of Education Project
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Dwight Allen, Director

5. Santa Cruz County Office of Education
Dr. Richard R. Fickel, Superintendent
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6. Pajaro Valley Unified School District
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7. Santa Cruz High School District
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8. San Lorenzo Valley Unified School District
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